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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,211	06/20/2005	Hans-Joachim Quenzer	1033033-000027	5248
21839 7590 05/26/2010 BUCHANAN, INGERSOLL & ROONEY PC POST OFFICE BOX 1404 ALEXANDRIA, VA 22313-1404			EXAMINER BEL'YAEV, YANA	
			ART UNIT 1791	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/540,211	<b>Applicant(s)</b> QUENZER ET AL.	
	<b>Examiner</b> YANA BELYAEV	<b>Art Unit</b> 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 16 February 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 17-20 is/are pending in the application.
- 4a) Of the above claim(s) 12-15 and 17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 18-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 19 March 2010 has been entered.

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Examiner recommends clarifying the clause of claim 1, "which has a lens underside facing the convex lens surface," (page 2, lines 10-11) by replacing the clause with language that will make the invention explicit and more clear, such as, "bottom surface of the lens," (specification, page 3, lines 24-25).

3. The term "reduced" in claim 6, regarding the elliptical gradient, is a relative term which renders the claim indefinite. The term "reduced" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-11 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,951,119 (Quenzer hereinafter) in view of *Compact Self-Aligning Assemblies with Refractive Microlens Arrays made by Contactless Embossing* (Schulze hereinafter), and further in view of US Patent 4,481,023 (Marechal hereinafter).

**Regarding claim 1**, Quenzer discloses a method for treatment of the contour of the surface of at least one optical lens, which is made of glass or a glass-type material (Quenzer, column 1, lines 1-3), placing a means perfectly matching a plane section of the optical lens (Quenzer, Figure 1, component 2), and heating said optical lens to a temperature of at least the transformation temperature of said glass or glass-type material (Quenzer, column 3, lines 46-48), wherein pressure equalization prevails between said convex lens surface and said lens underside

Art Unit: 1791

(Quenzer, column 3, lines 23-24), and after a certain period of time, during which said optical lens undergoes temperature treatment and subsequent cooling below said transformation temperature (Quenzer, column 4, lines 33-36), said means is removed from said optical lens (Quenzer, column 4, lines 36-40).

Quenzer does not specifically state that the at least one optical lens has a convex lens surface delimited by a circumferential line abutting on a plane section surrounding said circumferential line and which has a lens underside facing the convex lens surface. Quenzer, furthermore, does not specifically state that the mounting tool would be placed along said circumferential line of the optical lens on said plane section is placed a means perfectly matching said circumferential line and at least laterally bordering said convex lens surface.

Schulze, discloses that at least one optical lens have a convex lens surface delimited by a circumferential line abutting on a plane section surrounding said circumferential line and which has a lens underside facing the convex lens surface (Schulze, Figure 2). Schulze, furthermore, discloses that the mounting tool would be placed along said circumferential line of the optical lens on said plane section is placed a means perfectly matching said circumferential line and at least laterally bordering said convex lens surface (Schulze, Figure 3).

It would have been obvious for one of ordinary skill in the art to apply the microlens array and mounting tool, as disclosed by Schulze, to the method disclosed by Quenzer. The rationale to do so would have been the motivation to provide a highly precise, cost effective production method for the production of both microlenses and alignment structures with the main advantage being easy replication (Schulze, page 31, paragraph 2).

Art Unit: 1791

Lastly, with regard to the phrase “follow-up treatment,” the Examiner interprets that the method disclosed by Quenzer in view of Schulze comprises two steps and the instant application is the second step of the two-step process. The Examiner interprets that the start of the second step is the precise moment when the invention disclosed by Quenzer forms a convex lens surface. Quenzer does not have any limitations which state the invention could not be performed in two steps. Similarly, there are no limitations in the instant invention which preclude it from being the second step in a two step process, such as a limitation requiring the optical lens to be below the transformation temperature before the method of the instant application is applied to the optical lens.

In a similar field of endeavor, Marechal discloses a two-step process for molding glass articles (column 10, lines 52-54), including lenses (column 9, lines 52-53). Marechal discloses that it is preferable to have a two-step process as a more economical alternative to the long holds which are necessary in a single-step process (column 10, lines 42-50 and 61-63).

Thus it would have been obvious for one of ordinary skill in the art at the time of the invention to have the method disclosed by Quenzer in view of Schulze be performed in two-steps since it is known to press glass articles, including lenses (Marechal, column 9, lines 52-53 ), in a two step molding process (Marechal, column 10, lines 42-50 and 61-63). The rationale to do so, provided by Marechal, would have been that it is preferable to have a two-step process as a more economical alternative to the long holds which are necessary in a single-step process (column 10, lines 42-50 and 61-63).

**Regarding claim 10**, Quenzer does not specifically state that the at least one optical lens comprises a one-piece continuous array-like microlens having a multiplicity of single optical

Art Unit: 1791

microlenses, which are spaced apart, by plane sections, a means matching the arrangement and size of the circumference of the single microlenses is provided as a template, which is placed at least partly on said plane sections and surrounds said circumferential lines of said individual microlenses, and during said temperature treatment all said microlenses are heated uniformly and homogeneously.

Schulze, however, discloses that the at least one optical lens comprises a one-piece continuous array-like microlens having a multiplicity of single optical microlenses, which are spaced apart, by plane sections (Schulze, Figure 3, microlens component), a means matching the arrangement and size of the circumference of the single microlenses is provided as a template, which is placed at least partly on said plane sections and surrounds said circumferential lines of said individual microlenses (Schulze, Figure 3, LIGA mounting tool component), and during said temperature treatment all said microlenses are heated uniformly and homogeneously (Schulze, page 27, paragraph 2).

It would have been obvious for one of ordinary skill in the art to apply the method, as disclosed by Quenzer, to the microlens array and mounting tool disclosed by Schulze. The rationale to do so would have been the motivation to achieve a cost-effective solution for the alignment process of micro-optic components, which usually result in very high costs (Schulze, page 25, paragraph 5).

**Regarding claims 18 and 19,** Quenzer discloses that the optical lens is a microlens (Quenzer, column 2, line 6) but not that the microlenses are equidistantly spaced.

Schulze discloses that the microlenses are equidistantly spaced (Schulze, Figure 3).

Art Unit: 1791

It would have been obvious for one of ordinary skill in the art at the time of the invention to have the microlens, as disclosed by Quenzer, equidistantly spaced, as disclosed by Schulze. The rationale to do so would have been the motivation to achieve good uniformity of focal length and homogeneity of high quality within the arrays (Schulze, page 28, paragraph 2 and 3).

**Regarding claim 2,** Quenzer discloses that the temperature and the period of time of said temperature treatment are selected according to the degree of change of the surface contour (Quenzer, column 2, lines 46-49).

**Regarding claims 3 and 4,** Quenzer discloses varying the pressure acting on said convex lens surface during said temperature treatment by changing the gas pressure, respectively air pressure, by stating that when the partial pressure, of air or nitrogen (Quenzer, column 9, line 14), inside the interstices exceeds the surrounding atmospheric pressure during the subsequent flow process at elevated temperatures, which can be interpreted to mean that the pressure steadily increases during the temperature treatment (Quenzer, column 9, lines 15-20).

**Regarding claim 5,** Quenzer discloses pressing said means firmly against the planar glass material to create an intimate bond (Quenzer, column 9, lines 7-10).

While Quenzer does not specifically disclose using force to press firmly, it would be necessary to use force to create an intimate bond. Furthermore, Quenzer does not disclose pressing said means against said circumferential line, but it would have been obvious to one of ordinary skill in the art at the time of the invention that in order to treat the existing convex contours of the glass surface, it would be necessary to press said means against said circumferential line.



**Regarding claims 6 and 7,** Quenzer discloses that the optical lens is produced by means of a glass-flow process (Quenzer, column 3, lines 50-57) and has as a result of said process an extremely steep elliptical gradient in the region of said circumferential line (Quenzer, Figures 2 and 5), but does not explicitly disclose that the process results in said elliptical gradient being reduced or completely eliminated.

However, Schulze, discloses that proper control of pressure and temperature ensures that the material penetrating into the openings of the tool forms a spherical surface (page 25, paragraph 2). Since any slight reduction in the elliptical gradient is within the broadest reasonable interpretation of “reducing the elliptical gradient,” the Examiner interprets that the fact that Schulze discloses forming a spherical surface, the elliptical gradient must be reduced or eliminated.

It would have been obvious for one of ordinary skill in the art to apply the method, as disclosed by Quenzer, to the microlens array and mounting tool disclosed by Schulze. The rationale to do so would have been the motivation to achieve a cost-effective solution for the alignment process of micro-optic components, which usually results in very high costs (Schulze, page 25, paragraph 5).

**Regarding claim 8,** Quenzer discloses that the convex lens surface of said optical lens is raised above a horizontal plane during temperature treatment (Quenzer, Figure 5 and column 8, lines 56-65).

**Regarding claim 9,** Quenzer discloses that said means is brought into contact with said optical lens without wetting the surface (Quenzer, column 6, lines 2-7).

Art Unit: 1791

**Regarding claim 11**, Quenzer discloses that said temperature treatment occurs in such a manner that a reduction of said convex lens surface stems solely from the surface tensions acting along said convex lens surface, with the lens material being forced out of the regions of said exceedingly steep elliptical gradient on the convex-side into other regions of the lens body (Quenzer, column 5, lines 30-41).

**Regarding claim 20**, since the process described by claim 1 is obvious in view of Quenzer in view of Schulze, the elliptical gradient is inherent to the invention disclosed by Quenzer in view of Schulze. This is affirmed by applicant in the applicant's disclosure, wherein the applicant states this extremely steep elliptical gradient of the microlens in the edge region stems from a *process-inherent characteristic* typical of glass flow processes and therefore occurs unfailingly. Moreover, similar extremely steep elliptical gradients can also be observed in microlenses produced from thermoplastic lens material by means of a so-called contactless hot stamping process (Disclosure, page 2, paragraph 2).

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 1 and 6 have been considered but are moot in view of the new ground(s) of rejection.

*The Applicant argues that neither Quenzer et al. nor Schulze disclose or suggest the method of the presently claimed invention. Instead, each relate to initial forming of a lens from a flat substrate. Furthermore, the Applicant argues, it is clear that the method of claim 1 is directed to the treatment of a pre-existing or previously formed optical lens.*

Art Unit: 1791

The Examiner respectfully disagrees. Please refer to the rejection of claim 1. The Examiner interprets the instant application as the second step in a two step molding process which is disclosed by Quenzer. There is no limitation in Quenzer that states it could not be performed in two steps, wherein the first step forms the steep elliptical gradient to a predetermined point and the second step continues the process of performing a temperature treatment. Furthermore, there is no limitation in the claims or the specification that restricts the presently claimed invention to a method which cannot be part of a two-step process.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have performed this in a two-step process. The rationale to do so, provided by Marechal, would have been that it is preferable to have a two-step process as a more economical alternative to the long holds which are necessary in a single-step process (column 10, lines 42-50 and 61-63).

*The Applicant argues that Quenzer is directed to a method for creating a curved or contoured surface on at least one side of a flat glass-like substrate in the first instance, not a follow-up treatment on a preexisting contoured lens surface. The rejection notes that Quenzer discloses "methods of structuring surfaces of micro-mechanical and/or micro-optical components and/or functional elements consisting of glass or glass-type materials," however it is clear from the remainder of Quenzer that "structuring" in this context means "preparing." For example, nowhere does Quenzer disclose or suggest performing the claimed temperature treatment on a preexisting lens.*

The Examiner respectfully disagrees. Please refer to the rejection of claim 1. The Examiner interprets the instant application as the second step in a two step molding process

Art Unit: 1791

which is disclosed by Quenzer. There is no limitation in Quenzer that states it could not be performed in two steps, wherein the first step forms the steep elliptical gradient to a predetermined point and the second step continues the process of performing a temperature treatment. Furthermore, there is no limitation in the claims or the specification that restricts the presently claimed invention to a method which cannot be part of a two-step process.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have performed this in a two-step process. The rationale to do so, provided by Marechal, would have been that it is preferable to have a two-step process as a more economical alternative to the long holds which are necessary in a single-step process (column 10, lines 42-50 and 61-63).

*The Applicant argues that, just like Quenzer, Schulze discloses techniques for taking a flat piece of material and creating a curved or contoured surface on at least one side thereof. This is clearly illustrated in Figures 2-3 of Schulze. As with Quenzer, Schulze fails to disclose, or even suggest, a follow-up treatment of the contour of the surface of at least one optical lens having a convex surface, as clearly required by claim 1. Thus, even if the proposed combination of prior art references were appropriate, the claimed invention would not result.*

*Reconsideration and withdrawal of the rejection is respectfully requested.*

The Examiner respectfully disagrees. Please refer to the rejection of claim 1. The Examiner interprets the instant application as the second step in a two step molding process which is disclosed by Quenzer. There is no limitation in Quenzer that states it could not be performed in two steps, wherein the first step forms the steep elliptical gradient to a predetermined point and the second step continues the process of performing a temperature

Art Unit: 1791

treatment. Furthermore, there is no limitation in the claims or the specification that restricts the presently claimed invention to a method which cannot be part of a two-step process.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have performed this in a two-step process. The rationale to do so, provided by Marechal, would have been that it is preferable to have a two-step process as a more economical alternative to the long holds which are necessary in a single-step process (column 10, lines 42-50 and 61-63).

*The Applicant argues that Quenzer does not contain any reference whatsoever to the elimination of an elliptical gradient present on the curvature or contour of a surface of a pre-existing or a pre-formed optical lens. To reiterate, Quenzer discloses a technique whereby such an elliptical gradient is created in the first place. Thus, claim 6 is distinguishable over Quenzer in view of Schulze for at least this additional reason.*

The Examiner respectfully disagrees. Please refer to the rejection of claim 1. Schulze, discloses that proper control of pressure and temperature ensures that the material penetrating into the openings of the tool forms a spherical surface (page 25, paragraph 2). Since, reducing the elliptical gradient can be interpreted broadly to mean any slight reducing in the elliptical gradient, the Examiner interprets that the fact that Schulze discloses forming a spherical surface, the elliptical gradient must be reduced or eliminated.

It would have been obvious for one of ordinary skill in the art to apply the method, as disclosed by Quenzer, to the microlens array and mounting tool disclosed by Schulze. The rationale to do so would have been the motivation to achieve a cost-effective solution for the

Art Unit: 1791

alignment process of micro-optic components, which usually results in very high costs (Schulze, page 25, paragraph 5).

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YANA BELYAEV whose telephone number is (571)270-7662.

The examiner can normally be reached on M-Th 8:30am - 6pm; F 8:30 am- 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Y. B./  
Examiner, Art Unit 1791

/Jason L Lazorcik/  
Primary Examiner, Art Unit 1791

Application/Control Number: 10/540,211

Page 14

Art Unit: 1791